Does Italy Have a Stronger National Level of Industry Expertise Than a Local Level?

1. INTRODUCTION

Our paper examines whether the national level of auditor industry expertise is more dominant than the local level of expertise in Italy. Prior studies (Basioudis & Francis, 2007; Ferguson, Francis, & Stokes, 2003; Francis, Reichelt, & Wang, 2005) find that local industry experts charge a higher audit fee premium, suggesting that local expertise dominates in the U.S., Australia and the UK. Italy differs by having mandatory audit firm rotation (MAFR) (Republic of Italy, 1975), and a smaller local market for audits of publicly traded companies. Auditor industry expertise provides a conduit for transferring industry knowledge to the individual auditor. We predict that Italy should have a stronger national level of industry expertise, because higher client turnover under MAFR reduces the stability of clients at the local level which necessitates the national level to retain more industry expertise. As well, the smaller local market size generates fewer industry experts at the local level than the national level. In turn, the national level of expertise more efficiently transfers expertise to offices within the national network in a just-in-time basis as new clients are accepted.

Our paper is interesting because little is known about how MAFR affects industry expertise. MAFR has been the subject of debate for several decades, and has reemerged in recent years following the 2007-09 financial crisis (European Commission, 2010; PriceWaterhouseCoopers LLP, 2013; Public Company Accounting Oversight Board (PCAOB), 2011; The Conference Board, 2003). While Italy has had a MAFR requirement in place for more than four decades, the EU recently promulgated MAFR effective for 2016 fiscal years (European Parliament, 2014). Opponents argue that MAFR impairs industry expertise because a shorter tenure impairs the auditors acquisition of knowledge (Jamal, 2012), and can deteriorate office industry expertise when clients mandatorily change audit firms causing personnel to either

change industry specializations or else relocate (Daugherty, Dickins, Hatfield, & Higgs, 2012). We find evidence that audit fee premiums for national industry experts are higher than local industry experts, and we find corroborating evidence with audit hours.[1]

We contribute to the literature by showing results that differ from prior studies that were conducted in voluntary rotation regimes where the local level is more dominant (Basioudis & Francis, 2007; Ferguson et al., 2003; Francis et al., 2005; Numan & Willekens, 2012). Our results demonstrate that industry expertise is organized on country characteristics, such as the presence of a mandatory auditor rotation regime. Thus, the dominance of the local level, shown in prior studies, does not apply to all countries. We corroborate our audit fee premium results by conducting the same analysis using a neighboring country without MAFR in the period analyzed, Germany, but with a similar legal system (code law). We find that audit fee for national industry leaders are no different than local level leaders, which provides further support that MAFR contributes to a stronger national level of industry expertise.

Our paper is also interesting because little is known about whether audit fee premiums of industry experts reflect additional audit effort or are simply economic rents for holding more dominant client market shares. Prior studies show that clients of industry experts have higher audit quality (e.g., Balsam, Krishnan, & Yang, 2003; Dunn & Mayhew, 2004; Francis & Gunn, 2015; Krishnan, 2003; Reichelt & Wang, 2010), however the validity of the findings have been questioned (Minutti-Meza, 2013). There is also evidence that audit fee premiums reflect economic rents (Numan & Willekens, 2012). If audit fee premiums reflect effort, rather than economic rents, we should expect to find higher audit hours. A study by Bae, Choi, and Rho

[1] We do not examine audit quality because it is outside the scope of our paper, and adding it would increase the length of the paper.

(2016) provides evidence from S. Korea that audit fee premiums reflect greater audit hours; however, their study only examines national industry expertise in a regime with both MAFR and voluntary rotation. We extend Bae et al. (2016) by not only showing that national industry experts expend more audit hours relative to non-experts in a MAFR regime, but also local industry experts expend more audit hours.

Our paper is organized as follows. Section 2 discusses the background literature, and predictions. Section 3 discusses the empirical design including the sample and descriptive statistics. Section 4 reports the results including robustness tests. Section 5 concludes.

2. LITERATURE AND HYPOTHESES

2.1 National and Office Level Industry Expertise

Industry expertise stems from the investment in human capital in accounting professionals and the experience they gain from servicing clients (Ferguson et al., 2003; Francis et al., 2005; Solomon, Shields, & Whittington, 1999). National industry expertise and local industry expertise (hereafter, office industry expertise) are distinct levels of auditor industry expertise. National industry expertise is characterized by a firm-wide reputation for industry expertise, organization of expertise by industry, and various knowledge-sharing practices (Francis et al., 2005; Hogan & Jeter, 1999; Solomon et al., 1999). Knowledge sharing practices include internal benchmarking of best practices, standardized audit programs, industry specific databases, training programs, and the transfer of expert personnel to other offices through travel and consulting arrangements (Francis et al., 2005; Zerni, 2012).[2] Office-level industry expertise

[2] Information technology used for knowledge sharing include: KPMG's KWorld™, PriceWaterhouseCooper's TeamAsset™ and KnowledgeCurve™, and Ernst and Young's KnowledgeWeb™ (Zerni, 2012). See Vera-Munoz, Ho, and Chow (2006) for further discussion of factors affecting knowledge sharing within international accounting firms.

consists of deep industry and client knowledge possessed by audit personnel within a particular office (Francis et al., 2005). Human capital attributes are important to develop audit firm performance (Samagaio & Rodrigues, 2016). Audit personnel gain their expertise from the direct experience of working exclusively on industry specific engagements (Solomon et al., 1999).

The two levels of industry expertise transfer knowledge in different ways. National industry expertise is transferred from the national headquarters (or through an office expert) to offices within the national network through standardized firm policies and procedures and knowledge-sharing practices. Office industry expertise is transferred within the office by quality control procedures (e.g., supervision/coaching) and individual on-the-job experience.

National industry expertise ensures expertise is retained within the audit firm, and is transferred to offices that are in need of it. Mandatory audit firm rotation increases the importance of the national level, because if a sufficiently large number of clients in a particular industry rotate to another firm, the office will lose the knowledge and it will eventually be forgotten (Causholli, 2016). In order to retain the industry expertise in the audit firm, distinct knowledge sharing practices and firm-wide policies and procedures are needed at the national level. As new industry-specific clients are accepted, offices will require industry-specific knowledge to be transferred by the national level. While there are distinct differences in national and office level expertise, more germane to our study is understanding which level dominates by audit fee premium.

Prior studies provide evidence that office level of industry expertise dominates in audit fee premium over national level. Appendix A provides a list of studies examining audit fee premiums by national and office levels, country, and time period. These studies identify the national industry expert as the audit firm with the highest market share in a particular industry,

and the office industry expert as the same but for a particular city. The list shows that audit fee premiums for national industry experts range between statistically insignificant amounts to 8 percent, and between 13 percent and 16 percent for office industry experts. All of these studies examine countries with no MAFR requirement. Thus, it is unclear from these studies whether audit fee premiums differ between national industry expertise and office industry expertise under MAFR. To explore this matter further, we discuss the nature of audit fee premiums and industry expertise.

2.2 Audit Fee Premiums and Industry Expertise

Audit fee premiums consist of additional audit effort and economic rents (Okeefe, Simunic, & Stein, 1994; Simunic, 2014). They indicate that audit firms adopt a differentiation strategy (Cahan, Jeter, & Naiker, 2011; Francis et al., 2005; Jeter, 2014) by delivering higher audit quality with greater direct labor hours and greater investments in knowledge sharing. It is well documented in prior studies that industry experts are associated with higher audit quality, as evident from studies comparing earnings quality, disclosure quality and going concern opinion frequency (Balsam et al., 2003; Dunn & Mayhew, 2004; Francis & Gunn, 2015; Krishnan, 2003; Reichelt & Wang, 2010).[3]

Higher audit quality also infers that auditors will expend greater audit hours (Palmrose, 1986, 108), as evident from audit production theory (Okeefe et al., 1994; Simunic, 2014). For instance, auditors will expend more hours to more effectively constrain management's attempts to manipulate earnings with discretionary accruals. In support, Caramanis and Lennox (2008) find that audit hours are negatively associated with the likelihood and magnitude of income-

[3] Some studies believe that industry specialization measures are contentious (e.g., Minutti-Meza, 2013).

increasing discretionary accruals. In a study using S. Korean data, Bae et al. (2016) report that national industry expert auditors expend greater audit fees (and earn higher audit hours) than non-experts. They argue that industry expert auditors will expend more hours because they require additional evidence, and they protect their reputation in a competitive market (Bae et al., 2016).

However, their results may not generalize to our setting because 1) S. Korea has weaker investor protection (Wingate, 1997), lower audit quality, and weaker enforcement of accounting standards (Brown, Preiato, & Tarca, 2014), 2) their sample period includes a mandatory audit firm rotation regime followed by a voluntary firm rotation regime, and 3) they do not examine the local level of auditor expertise. Thus, our results are more generalizable to other EU countries who recently adopted MAFR reforms (European Parliament, 2014). To better understand our setting, we turn our discussion to Italy's regulatory environment.

2.3 Mandatory Auditor Rotation and Regulatory Developments in Italy

Italy adopted mandatory audit firm rotation in 1975 under Presidential Decree D.P.R. No. 136 (Republic of Italy, 1975). Under this law, publicly listed companies must mandatorily rotate their audit firm every nine years. Recently, the European Parliament passed Regulation No. 537 in 2014 (effective in 2016) requiring a ten-year MAFR term, with an additional ten-year term if the audit engagement is put out for public bid (European Parliament, 2014).[4]

Studies examining audit fees and audit hours within MAFR regimes are limited. Cameran, Francis, Marra, and Pettinicchio (2015) show in Italy that after a client rotates to another audit firm, audit fees are lower and audit hours are higher in the first year. Kwon, Lim,

[4] However, efforts in the U.S. to pass a MAFR requirement met with overwhelming resistance by the audit profession and financial executives (Orenstein, 2013; Ryan, 2013; Tysiac, 2013).

and Simnett (2014) show in S. Korea that when the country changed from a voluntary audit firm rotation regime to a mandatory rotation regime, audit fees and audit hours increased. Kwon et al. (2014) compare national industry market shares in S. Korea during the time of change to MAFR and find a decline in national industry market shares after MAFR was implemented.

A concurrent study by Mazza, Azzali and Reichelt (2017) conducts interviews of Big 4 partners in Italy to gain a better understanding of how industry specialization operates in the country. They find that industry specialization in Italy operates at an area level and at a national level. Unlike the U.S., the area level subsumes the office level because two offices (Milan and Rome) dominate in revenues (56 percent). They also learn that partners express a strong desire to retain industry knowledge at the national level.

2.4 Hypothesis

Prior literature finds that in the U.S., U.K., and Australia, industry specialization is a joint effect of a national level and a local office level, and that the local level dominates over the national level in audit fee premium (Basioudis & Francis, 2007; Ferguson et al., 2003; Francis et al., 2005). However, the institutional and audit market characteristics of Italy differ from the countries in these studies, such that the national level is arguably more dominant than the local level. We argue that Italy's higher client turnover and its smaller publicly-listed audit market, heightens the sensitivity of the loss of *tacit* industry-specific knowledge at the local level, and consequently heightens the sensitivity of lost industry expertise. To retain industry expertise in the audit firm, a stronger national level of industry expertise is needed.

Italy's nine-year mandatory audit firm rotation term shortens audit firm tenure and increases the turnover of publicly-traded clients. Compared to the U.S., where audit firm tenure

averages 12 years (Davis, Soo, & Trompeter, 2009), Italy has an average audit firm tenure of 4.5 years and a substantially higher client turnover. With a nine-year maximum MAFR term, at least one-ninth of the publicly traded clients annually depart the office, on average, with a potential replacement from another audit firm, which may be in a different industry. Higher client turnover leads to a greater risk that industry-specific knowledge is forgotten in the office, when there are insufficient industry clients to maintain the learning experience (Causholli, 2016). Weakened industry expertise is echoed by opponents of MAFR who claim that the accretion of industry expertise is impaired by a shorter client-auditor engagement term (Jamal, 2012). In order to retain industry-specific knowledge in the firm and transfer it to offices in need, the national level should be more dominant than in countries with voluntary audit firm rotation.

Under MAFR, tacit industry knowledge is more vulnerable to being forgotten at the local office level. Tacit knowledge, compared to explicit knowledge, is transferred by socialization such as highly interactive conversations, observations, and shared experiences, such as between consulting partners and engagement partners (Causholli, 2016; Vera-Munoz et al., 2006). On the other hand, explicit knowledge is transferred by written communication such as industry documentation of common risks and common accounting methods. Tacit knowledge includes auditor judgment such as assessment of risk, materiality, and detecting client errors. Auditor judgment involves complex decisions that are learned from prior industry engagements by interacting with experienced audit professionals. For instance, an auditor in the construction industry would learn about assessing the risk of misstated revenue, under the percentage of completion method, by discussing their assessment with a national industry expert. With greater client turnover, more socialized national knowledge sharing is needed to transfer tacit industry-specific knowledge to the local offices. Tacit industry knowledge is transferred by training and

consulting from industry expert partners at the national headquarters and from other offices (Mazza et al. 2017).

The loss of tacit industry knowledge from higher client turnover is exasperated by Italy's smaller local audit market for publicly-traded clients. There are an estimated 10 publicly-listed clients per city among the Big 4 in Italy's 20 cities (Cameran et al., 2015).[5] However, in the U.S., there are an estimated 32 clients per city, among 202 metropolitan statistical areas (Reichelt and Wang 2010).[6] Compared to the U.S., Italy has three times fewer clients per office, but is similar to other EU countries.[7] If an office loses a sufficient number of clients in an industry, the tacit industry knowledge will be easily forgotten. For instance, ENI S.p.A. – a Global Fortune 500 client in the energy industry, could potentially result in the loss of most of the energy industry knowledge for the Rome office. In turn, a smaller audit market increases the need to retain tacit industry knowledge, because local industry expertise does not sufficiently develop, rather it develops stronger at the national level.

Industry expertise is transferred to offices within the audit firm when one office loses a client in a particular industry and another office gains a different client in the same industry (particularly a large client). National industry expertise is transferred by internal benchmarking of best practices, standardized audit programs, industry specific databases, training programs, and the transfer of expert personnel to other offices through travel and consulting arrangements (Francis et al., 2005; Zerni, 2012). Expert personnel provide training and consulting from the

[5] Cameran et al. (2005) report that Italy has 204 publicly-listed clients. According to the Big 4 websites in Italy, the Big 4 offices are located in 20 cities on average (between 16 and 25).
[6] Reichelt and Wang (2010) report 32,479 firm-year observations over five years (2003-07) in 202 unique metropolitan statistical areas; an average of 32 publicly-listed clients.
[7] Zerni (2012) reports from Swedish data that there are an average of 172 firms per year. According to the Big 4 websites, there are an average of 56 offices (EY: 50, PWC: 100, KPMG: 50, and Deloitte: 25); thus, each office has an average of three publicly-listed client firms.

national headquarters and from other offices (Mazza et al. 2017). In Italy, higher client turnover from MAFR and a smaller audit market for publicly-traded clients, arguably makes the national level of industry expertise more important for retaining and transferring industry-specific knowledge to offices within the audit firm.

Turning the discussion to audit fee premiums of industry experts. Prior studies report that industry experts incur an audit fee premium (Basioudis & Francis, 2007; Ferguson et al., 2003; Francis et al., 2005; Reichelt & Wang, 2010). A consequence of stronger national industry expertise is that audit fee premiums are higher than local industry expertise. These studies have defined industry experts as the industry market leader. Our first hypothesis follows.

Hypothesis 1 *–audit fee premiums are higher for national level industry leaders than for local level industry leaders.*

3. EMPIRICAL DESIGN

3.1 Industry specialization measures

We employ two levels of industry expertise: a national level and a local level. For the national level, we define a national industry specialist as the audit firm that is the leader in market share of client sales for a particular industry and year (Bae et al., 2016). Use of sales, rather than audit fees, mitigates the mechanical relation between audit fee premiums and auditor market share, identified by Minutti-Meza (2013). We also use client sales, rather than audit fees, because the sample is larger, which yields a more accurate market leadership measure. In our robustness tests, we find support for this choice. Industries are classified by the Global Industry Classification Standard (GICS). GICS is superior to the Standard Industrial Classification (SIC) in capital market research applications (Bhojraj, Lee, & Oler, 2003).

In Italy, the Big 4 local level is organized by area (Mazza et al. 2017). The large majority of audit fee revenues (untabulated, 56 percent) are from the two area head offices (Milan –44%. and Rome – 12%), while partners work in multiple offices within the same area (Mazza et al. 2017). Rather than using the Metropolitan Statistical Area (MSA), available in the U.S. (e.g., Reichelt & Wang, 2010), or the geographical city in the U.K. (e.g., Basioudis & Francis, 2007), we use area because it is similar to the MSA. Studies that use U.S. data specify auditor local specialization in terms of the MSA in which the audit office is located. The U.S. Census Bureau defines an MSA as the core of the city and the surrounding areas that have commuter relations with the core. The MSA represents a geographic-economic unit within which individuals have frequent and close contact by commuter relations with the core. The frequent and close contact facilitates the transfer of tacit knowledge. The European Commission's statistics division (EUROSTAT) defines European areas based on the Nomenclature of Territorial Units for Statistics (NUTS). The NUTS area is similar to the US MSA because people who reside in an area typically have close family contacts, and travel by car or train is convenient, inexpensive, and does not require an overnight stay.

We choose the two major industrial areas of Italy: the North and the Center-South. The two areas are more representative of Italy's industrial activity, even though the unit of measure is biased against finding results.[8] At least two other studies concur that many countries have one or two major cities were publicly-listed clients are located (Francis, Michas, & Seavey, 2013; Lim & Tan, 2009). Industries tend to geographically cluster (Porter, 1990, 154) with the greatest

[8] Italy is organized into three *geographic* areas (North, Center and South) as defined by the European Commission's statistics division (EUROSTAT) and by the Italian National Institute for Statistics (Instituto Nationale di Statistica (ISTAT), 2014) using standard territorial definitions from the NUTS. However, because there is so little industrial activity in the South, only one industry leader appears in the South for the entire sample period (2005-13); consequently, we combine the Center and South areas into one industrial area.

number in the North area (National Observatory of Italian Districts, 2009). Italy's economy is largely driven by the manufacture of high quality consumer goods, and consists of a developed industrial north and a less developed agricultural south (U.S. Central Intelligence Agency, 2017). We also provide analysis using the city level, based on the 20 government regions, to support our conjecture that the area level is the more appropriate measure. Following prior literature (e.g., Basioudis & Francis, 2007; Francis et al., 2005; Reichelt & Wang, 2010), a Big 4 audit firm is considered an industry leader if there is at least one other audit firm in the same area, industry and year. This restriction ensures that a sole audit firm in a particular area and industry is not assigned an industry expert because of an uncompetitive market (Francis et al. 2005).

Table 1 reports the audit firms that are industry leaders by industry and year. Panel A reports the national level, Panel B reports the area level for the North and the Center-South. All panels report considerable variation over time in industry leaders, partly because of mandatory rotation of audit firms. Beginning with national industry leaders, Panel A reports that PWC is the most frequent industry leader (28 out of 72 industry-years). Each Big 4 firm on average has 22 percent of the market share (Table 3). In untabulated results, the mean market share for the national leader is 27 percent and for the second place national leader is 22 percent. At the area level, the mean market share for the leader is 23 percent, and for the second leader is 22 percent. At the city level, the mean market share for the leader is 27 percent, and for the second leader is 23 percent. Compared to the U.S. (Francis et al., 2005), Italy has a lower mean market share for national, area and city leaders (27, 23, 27 percent vs. 50 percent at the national level and 69 percent at the city level), but compared with Australia (Fergusson et al., 2003), Italy has a similar mean market share for national leaders (27 percent vs. 28 percent). Moving to area industry leaders, Panels B report that there is considerable variation in industry leadership over time.

[*INSERT TABLE 1 HERE*]

3.2 Multivariate Tests

To test our prediction, we estimate equation (1):

$$LAF = \beta_0 + \beta_1 INDUSTRY\ LEADER + \beta_2 SIZE + \beta_3 CATA + \beta_4 QUICK + \beta_5 LEV + \beta_6 ROA + \beta_7 LOSS + \beta_8 \sigma\ (CFO) + \beta_9 SALES\ GROWTH + \beta_{10} TENURE + \beta_{11} |ACCR\_1| + \beta_{12} BIGN + \beta_{13} UNCLEAN\_OPINION + \beta_{14} LAF\_UNCONS + \beta_{15} LABOR\_COST + INDUSTRY\ AND\ YEAR\ FIXED\ EFFECTS + e \quad (1).$$

Equation (1) is estimated with industry and year fixed-effects in order to control for systematic differences in audit fees across industries and across time. We cluster robust standard errors by client firm to control for heteroskedasticity and the lack of temporal independence of residuals within client firms (Petersen, 2009), and to avoid firm-fixed effects estimation when it is not feasible (Wooldridge, 2016, 450).[9] Variable definitions are described in Appendix B.

LAF is the log of total audit fees. Total audit fees include the audit of the financial statements of the consolidated entity, and the audit of the individual financial statements of the parent and the subsidiaries (group accounts). We include not just the audit of the consolidated entity but also of the group accounts to better measure complexity (size, international presence, and dominance of the parent company) and related audit effort.[10] These audit fees do not include non-audit fees for non-audit services because Italy restricts auditors from providing non-audit services. *LAH* is the log of audit hours for the total audit fees. Equation (1) estimates audit hours using the same model as audit fees, following prior studies (Bae et al., 2016; Cameran et al., 2015).

[9] Firm fixed effects are not feasible when sufficient degrees of freedom are lost and type II errors are more likely.
[10] Audit fees also include interim financial reviews and accounting procedure audits.

INDUSTRY LEADER is the variable of interest and denotes three indicator variables for industry specialization: a national industry leader, an area industry leader, and a city industry leader.[11] To test our hypothesis, we expect the coefficient on the *INDUSTRY LEADER* variables to be positive, and we expect that the coefficient on the national leader is greater than that of the area industry leader.

Control variables for estimating audit fees are based on prior studies examining audit fees and earnings quality (e.g., Basioudis & Francis, 2007; Donohoe & Knechel, 2014; Francis et al., 2005; Reichelt & Wang, 2010).[12] Client size (*SIZE*) is the log of total assets. Several prior studies measure client risk by *CATA*, *QUICK*, *ROA*, *LEV*, and *UNCLEAN OPINION*. We also control for volatility of operating cash flows (σ *(CFO)*) (Donohoe & Knechel, 2014; Graham, Harvey, & Rajgopal, 2005), *SALES GROWTH* for economic life cycle (Dickinson, 2011), *TENURE* for growth in audit fees with audit firm tenure (Cameran et al., 2015; Donohoe & Knechel, 2014), and total accruals magnitude (|*ACCR_1*|) for earnings quality (Hribar, Kravet, & Wilson, 2014). *BIGN* controls for audit firm size and Big 4 brand-name.

3.3 Sample and Descriptive Statistics

Our sample selection starts with all Italian companies listed on the Milan Stock Exchange that are available on Compustat Global. We exclude the financial sector from our analysis

[11] For the purpose of the city leader variable, we base the city on the 20 Italian government-based regions. They are: North (Valle d'Aosta, Veneto, Trentino Alto Adige, Friuli Venezia Giulia, Emilia Romagna, Lombardia, Liguria, Piemonte), Center (Lazio, Toscana, Umbria, Marche) and South (Abruzzo, Molise, Campania, Basilicata, Puglia, Calabria, Sicilia, Sardegna). The Big 4 audit firms have approximately one office in each region.

[12] Given that we have a small sample size compared to previous studies, we are careful to select control variables to avoid problems related to the degree of freedoms from adding too many independent variables. We do not include client firm age because the Italian listed firms are on average very old (some are hundreds of years). We do not include years of listing because Italian firms often use loan financing before the firm is listed on a stock exchange. We do not include the fiscal year-end because a very large proportion of our sample (95%) has a December 31 year-end. We do not include the Herfindahl-Hirschman index of auditor area industry concentration (Numan & Willekens, 2012) because the coefficient was not significant ($p>0.10$), and there is too little variation over time to be reliable for fixed effects estimation. We do not include the number of business segments because Compustat does not report it, and we use size to control for complexity. In our robustness tests, we use a hand-collected business segments variable from a smaller sample, and our main results still hold.

because of its dissimilar nature, and we exclude the telecommunications sector because there are too few observations to compute auditor industry specialization variables. We create a separate sample of audit hours for additional analysis. Our sample period is from 2005 to 2013. This period is chosen because too few observations are available prior to 2005, and IFRS was adopted in 2005 (European Parliament, 2002), which allows a cleaner estimation of the audit fee and audit hour models.

Table 2, details the sample selection process for the sample. The sample starts with 2,096 non-financial and non-telecommunication firm-year observations from Compustat Global. We *hand-collect* the names of the audit firms directly from the auditor's report in the consolidated annual report to ensure accurate identification. We delete 126 firm-year observations without an identified audit firm and other variables required to compute industry market share. We require a minimum of two audit firms per area-industry-year combination to identify an auditor industry market leader (Francis et al., 2005). The sub-total is 1,970 firm-year observations.

Next, we hand-collect audit fees and audit hours from publicly available annual shareholder meeting minutes of Italian-listed companies. Two of the authors (who are faculty members at an Italian university) organized a team of seven research assistants to download the annual shareholder meeting minutes from the client firm's websites. From March to June, 2015, the team manually downloaded the minutes and extracted the audit fees and hours into a spreadsheet, which was checked for accuracy in July, 2015 by different research assistants. The faculty members met with the team every two weeks to plan and control the quantity and quality of the data. Appendix C provides two examples of the disclosures of audit fees and hours: Pirreli & C. S.p.A., and Davide Campari-Milano S.p.A. After deducting observations with missing audit fees, hours, and control variable values, the final sample consists of 1,050 firm-year observations

for audit fees, and 1,123 firm-year observations for audit hours.[13] Based on the nine-year audit fee (audit hour) sample, there are 58 (62) clients per area per year. At the office level, among the approximately 20 cities in Italy, there are an average of 5.8 (6.2) clients per city per year. At the area level, there are an average of seven clients per area-industry-year combination. Compared to the area level, the office level has fewer industry-year combinations available to compute an auditor industry leader.

[INSERT TABLE 2 HERE]

Table 3 reports descriptive statistics for the Italy sample. The mean client fundamental variables (*LAH*, *LAF*, *SIZE*, *LEV*, *ROA*, *LOSS*, and *TENURE*) are comparable to those used by Cameran et al. (2015), except that mean *SIZE* is lower in our sample because Cameran et al. (2005) excludes non-Big 4 clients. Other client fundamental variables (*CATA*, *QUICK*, σ(*CFO*), *SALES GROWTH*, and *BIGN*) are comparable to other related studies (Basioudis & Francis, 2007; Carson, 2009; Corbella, Florio, Gotti, & Mastrolia, 2015; Reichelt & Wang, 2010). The mean *National Leader* (35.2%) is comparable to Basioudis and Francis (2007) who report 33.6% in the U.K. The mean *Area Leader (*39.7%) and mean *City Leader* (37.9%) are comparable to the same study's mean city leader variable (46.8%).

[INSERT TABLE 3 HERE]

The correlation matrix (Table 4) shows that the auditor leadership variables are positively correlated with audit fees and audit hours. Table 4 does not show significant problems of multicollinearity.[14] The correlations among many of the independent variables are under 50 percent (except *SIZE* and *LAF*, *LOSS* and *ROA*, and *QUICK* and *LEV*). *National Leader* and

[13] Some companies disclose only audit hours and no audit fees.
[14] For equation (1), we find no evidence of multicollinearity, since all variance inflation factors are under 7.51, which is well below the threshold of 10 (Kennedy, 2008, 199).

Area Leader are highly correlated (greater than 70%), while *City Leader* is highly correlated with *National Leader* (47%) and *Area Leader* (58%). Thus, we estimate equation (1) separately for the three leadership variables, and test the difference in the *National Leader* and *Area Leader* coefficients by simultaneous equation estimation.

[INSERT TABLE 4 HERE]

4. MULTIVARIATE RESULTS

4.1 Main Results

The results of estimating equation (1) are reported in Table 5 for testing the relation between national and area levels of auditor industry expertise and audit fees Table 5, Panel A, reports that the national level of industry leadership has a 20.5 percent audit fee premium (over non-leaders) ($p<0.01$) which is greater than the area level audit fee premium of 11.4 percent ($p<0.10$, one-tailed).[15] The city level of industry leadership is not significantly different from zero; suggesting that city level leadership is virtually non-existent. This result also suggests that the area level is a more appropriate unit of industry leadership than the city level.

Panel B reports that the difference between the audit fee premium of the national industry leader and the area industry leader is statistically significant ($p<0.05$, one-tailed), which supports hypothesis 1. It is also economically significant – national industry leaders have a 10.7 percent greater fee premium for national industry leaders than area industry leaders over non-leaders. Audit fee premiums are comparable to prior studies (e.g., Francis et al. 2005), except that Italy's national level is greater.

[15] Following Craswell, Francis, and Taylor (1995), the audit fee premium in percentage points is $(e^z -1)*100$, where z is the coefficient on the industry leader variable.

In short, national industry experts have a higher audit fee premium over area industry experts. We do not observe an audit fee premium for the city level of industry expertise, likely because each area is dominated by a major city – Milan in the North, and Rome in the Center-South, consistent with Mazza et al. (2017). In a country where the audit regulatory environment is characterized by mandatory audit firm rotation versus other countries that have voluntary audit firm rotation (Australia, UK, US, and NZ), and a smaller audit market, we observe a more centralized organization of industry expertise at the national level.

[INSERT TABLE 5 HERE]

4.2 Additional Analysis

4.2.1 Audit Hours Analysis

Audit fees reflect audit hours expected by audit personnel (Cameran et al., 2015; Simunic, 1980), so we expect that audit hour premiums should be higher for national industry experts than local industry experts. A related paper by Bae et al. (2016) find that audit hours are higher for national industry experts.

We hand-collect audit hours when audit fees were hand-collected. We substitute audit hours for audit fees in equation (1), and estimate the equaiton. Table 6, Panel A reports that audit hours are higher for national industry leaders (over non-leaders) by 18.3 percent ($p<0.01$) compared to 10.1 percent ($p<0.10$, one-tailed) by area industry leaders, and the difference is statistically significant (Panel B) and economically significant – national industry leaders have 9.5 percent greater hours than area industry leaders over non-leaders. These results corroborate our main results with audit fees, and suggest that national industry experts expend greater hours than area level industry experts. These results imply that industry expert auditors use a

differentiation strategy to distinguish higher quality in audit hours in a setting that is characterized by mandatory audit firm rotation, a smaller audit market, and more centralized industry expertise. National industry experts appear to be stronger differentiators than area industry experts.

[INSERT TABLE 6 HERE]

4.2.2 Auditor Industry Leadership in Germany

For comparison purposes, we perform analysis of audit fees of a neighboring country – Germany (audit hours are not publicly available). We choose Germany because it is similar all respects except that it does not have mandatory audit firm rotation. Its population (83 million) is similar to that of Italy (61 million). It did not have MAFR during the sample period (2005-2013) (Lennox, 2014). Untabulated results show that our sample of German listed firms has a maximum audit tenure of 20 years and a high frequency of firms audited by the same audit firms for 12 years. It adopted the same audit standards (IAASB) and accounting standards (IFRS) as a European Union member (European Parliament, 2002). It has a code law requirement (Brown et al., 2014; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998). It has similar accounting and auditing quality. Brown et al. (2014) assigns Germany and Italy a similar accounting enforcement rating (44 and 46, respectively), and a similar audit quality rating (23 and 27, respectively).[16] We did not choose the next most similar country, France, because it has a joint audit requirement which would be less comparable for computing industry expertise (Francis, Richard, & Vanstraelen, 2009). We divide Germany into two areas, East and West, based on the 16 NUTS subdivisions.

[16] Brown et al. (2014) surveys 51 countries, and reports for 2008 that the audit quality index has a mean of 18.25 and a standard deviation of 8.27, and the accounting enforcement index as a mean of 12.59 and a standard deviation of 6.65.

Table 7, Panels A and B, report supporting tables for audit firm leaders in Germany for the national level and the area level, respectively. Panel A reports that PWC (33 industry years) and KPMG (37) are the two dominant national audit firm leaders in Germany, accounting for 70 out of 72 industry years, while EY and PKF appear only once, and DT does not appear at all. Compared to Italy, Germany's national audit firm leaders are concentrated among two Big 4 audit firms, while Italy is more equally distributed among the Big 4. Panel B reports that the East area is more equally distributed among three of the Big 4: PWC (37), KPMG (22), and EY (13), when compared to the West where KPMG (46) is more dominant, followed by PWC (20), EY (5), and PKF (1).

[*INSERT TABLE 7 HERE*]

Our sample includes all German companies that are available from the EURbusiness database and Compustat Global. Similar to the sample of companies from Italy, we exclude the financial sector telecommunications sector from our analysis. The sample of companies from Germany includes publicly-listed companies over the sample period 2005-2013.

Table 8 details the sample selection process for the Germany sample. We use the EUR business database to obtain audit fees, and we join it with the Compustat Global database for financial statement variables and audit variables (tenure and opinion). The final sample size has 2,910 firm-year observations, after deducting 1,028 observations with missing values necessary to compute auditor expertise, and 1,307 observations with missing audit fees and control variable data. There are an average 161 clients per area per year. Among the 16 subdivisions in Germany, there are an average of 20.2 companies per subdivision per year. The Germany sample is larger (2,910) than the Italian sample (1,050) and has more observations per area.

[*INSERT TABLE 8 HERE*]

Table 9 reports descriptive statistics for the Germany sample. Many of the variables are comparable to Italy, with a few exceptions. The Germany sample has lower financial leverage, smaller Big N audit market share, and less frequent auditor industry leadership. Prior cross-country studies (Kwon, Lim, & Tan, 2007; Lim & Tan, 2009) show a similar pattern for these exceptions. Audit firm tenure is greater for the Germany sample because Germany does not have mandatory audit firm rotation.

[*INSERT TABLE 9 HERE*]

The correlation matrix for the German sample (Table 10) shows similar to the Italy sample results. Auditor leadership variables are positively correlated with audit fees and audit hours. Correlations among the independent variables are under 50 percent (except for *SIZE* and *LAF*, *LOSS* and *ROA*). *National Leader* is highly correlated with *Area Leader* (56%), while *City Leader* is highly correlated with *National Leader* (29%) and *Area Leader* (44%).[17]

[*INSERT TABLE 10 HERE*]

For the Germany sample, the results of estimating equation (1) for hypothesis 1 are reported in Table 11. We compare whether audit fee premiums differ between the national and local levels for Germany which does not have mandatory audit firm rotation. Table 11 reports that the national industry leader has an audit fee premium of 14.5 percent ($p< 0.01$), and the area industry leader has an audit fee premium of 12.2 percent ($p< 0.05$); however these premiums are not statistically different ($p= 0.373$). In short, we conclude that the audit fee premium is no different between the national level and the local level. Given that Germany does not have MAFR, and Italy does, MAFR likely contributes to a stronger national level of industry

[17] For equation (1) for Germany, we find no evidence of multicollinearity, since all variance inflation factors are under 7.23, which is well below the threshold of 10 (Kennedy, 2008, 199)

expertise. However, we cannot rule out that the larger area size of Germany contributes to the difference.

[*INSERT TABLE 11 HERE*]

4.2.3 Auditor Industry Leadership Based on Client Lagged Total Assets

We repeat the analysis for the Italy sample by changing the industry leader definition using client lagged total assets (Francis et al., 2005, 130), for the purpose of computing auditor industry market share. Using lagged client assets mitigates any potential mechanical relation between market share and audit fee premium (Minutti-Meza, 2013).[18] The coefficient (untabulated) on the national industry leader is greater than the area industry leader for both audit fees (20.1 percent vs. 8.7 percent), and the difference is statistically significant for audit fees ($p<0.05$).[19] These results suggest that are main results are robust to an alternative measure of industry leadership.

4.2.4 Audit fees for the audit of parent companies

The main analysis uses audit fees reported in the minutes of the annual shareholder meeting (see Appendix C for examples). They include the review of the interim financial statements and accounting procedures, the statutory audit of the consolidated financial statements, and the statutory audit of the group accounts. Most of the companies in our sample report a total amount for these three items. For robustness, we restrict our analysis to a subsample of firms that report separate audit fees and audit hours for the consolidated financial

[18] We repeat the analysis computing industry leadership of the national industry leader and the area industry leader by market share of audit fees and by market share of audit hours. We find that our results are not consistent when compared to using market share of client assets or client sales. We conclude that client sales and client assets are more reliable, likely because there are more observations to accurately compute the auditor's industry market share.
[19] We find robust results with audit hours (14.6 percent vs. 4.6 percent), and the difference is statistically significant ($p<0.05$).

statement audit (n=664) and a subsample of firms that separately report the statutory audit of the group accounts (n=564). We find for the consolidated financial statement audit subsample, there is an audit fee premium for the national industry leader (37.4 percent, p=0.004) that is higher than the area industry leader (10.8 percent, p=0.34), and the difference is statistically significant (p<0.01) (untabulated). We find for the group accounts sub-sample, there is an audit fee premium for the national industry leader (26.9 percent, p=0.01) that is higher than the area industry leader (9.4 percent, p=0.344), and the difference is statistically significant (p=0.02) (untabulated). In short, our results are robust to separating audit fees between the consolidated financial statement audit and the group accounts audit.[20]

4.2.5 Complexity

To rule out the possibility that complexity is an omitted variable, we add to equation (1) the number of business segments, the number of subsidiaries, and foreign revenue. We hand-collected these variables for the period 2008–2011 for a subsample of 414 observations with available data, following the Cameran et al. (2015) model. We find that the coefficient on the national industry leader variable remains positive and statistically significant (0.260, p<0.01), the coefficient on the area industry leader variable remains positive and statistically significant (0.145, p=0.05, one-tailed), and the national leader has a higher fee premium than the area leader (p=0.04) (untabulated).[21] In short, our results are robust to controlling for complexity.

4.2.6 Hourly rate

[20] For audit hours, the results are robust. There is a premium for the national industry leader for the consolidated financial statements audit subsample (33.1 percent, p<0.01) that is greater than the area industry leader (8.2 percent, p=0.43), and the difference is statistically significant (p<0.01). As well, there is an audit hour premium for the group accounts subsample for the national industry leader (24.8 percent, p=0.03) that is greater than the area industry leader (7.3 percent, p=0.49), and the difference is statistically significant (p= 0.03) (untabulated).

[21] For audit hours, we find that the coefficient on the national industry leader variable is positive and statistically significant (0.202, p=0.04), and the coefficient on the area industry leader variable is positive (0.139, p=0.06, one-tailed) even though the difference is less evident (p=0.28) (untabulated). The less significant results are likely because of the reduced sample size from 1,123 to 414 firm-year observations.

Different from Bae et al. (2016), we argue that higher audit hours by industry specialists are not driven by a lower hourly rate. We compute the fees per hours for a subsample of firms for which we have both audit fees and audit hours and then we use the natural logarithm of the hourly rate as the dependent variable. The coefficients on the industry leader variables are positive and insignificant, confirming that higher audit hours by industry specialists are not driven by a lower hourly rate.

5. CONCLUSION

Our paper examines how auditor national industry expertise and area industry expertise is organized in Italy where mandatory audit firm rotation has been in effect since 1975. Industry expertise is a conduit to the transfer of industry specific-knowledge by auditors. Italy has higher client turnover, because of a nine-year mandatory audit firm rotation (MAFR) requirement, and it also has a smaller publicly-listed client audit market than the U.S. We predict that national industry expertise is stronger than area industry expertise because higher client turnover, and a small audit market, increases the sensitivity of industry-specific knowledge being lost at the local area level. We find that audit fees of industry specialists at the national level and the area level are greater than non-specialists. We do not find the same evidence for city industry specialists. However, different from prior studies that are restricted to countries with voluntary audit firm rotation (Ferguson et al. 2003; Francis et al. 2005; Basioudis and Francis 2007), we find that national industry specialization dominates over area industry specialization in audit fee premiums and audit hours, suggesting there is greater centralization of industry specialization in Italy. We conduct the same analysis for companies located in Germany which has a similar legal and regulatory characteristics, but does not have MAFR. We find no difference between the audit fee premiums of national industry specialists and area industry specialists. However, the sample

size for Germany is larger. We conclude that the higher client rotation of MAFR is a contributing factor, as well as a smaller audit market size. Our study has a number of implications for regulators and legislators considering to adopt MAFR.

One implication is that MAFR appears to weaken the local level of industry expertise which can effect audit quality as a whole. More frequent turnover of clients requires industry expert audit personnel to either adopt another industry, or else relocate, when a significant number of clients depart from an industry and are not replaced. This effectively can create a "brain drain" of client and industry specific knowledge, thus shifting a greater burden on the national headquarters to nationalize industry expertise, such as through national industry specific training programs and consulting industry experts. Our results show that audit fee premiums and audit hour premiums are greater for national industry experts than that of area industry experts, and the differences are statistically and economically significant. A potential consequence is that with more frequent turnover of clients, auditor quality is weakened at the office level where engagement partners and staff have a more intimate knowledge of the client. However, their industry knowledge has a shorter useful life and can depreciate quickly with the loss of expert personnel to other offices or other industries. Combined national and local levels of audit quality could be lower than in countries without MAFR, if national industry expertise cannot sufficiently compensate for the loss of local level expertise.

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Table 1– Audit Firm Industry Leaders by Year and Industry – Italy Sample

Panel A – National Leaders

	2005	2006	2007	2008	2009	2010	2011	2012	2013
10	PWC	PWC	PWC	PWC	PWC	PWC	EY	EY	EY
15	EY	EY	EY	EY	EY	EY	KPMG	KPMG	KPMG
20	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC	KPMG
25	DT	DT	PWC	DT	EY	DT	DT	DT	EY
30	PWC	PWC	PWC	EY	EY	EY	PWC	PWC	PWC
35	EY	EY	EY	EY	DT	DT	DT	EY	PWC
45	PWC	PWC	PWC	PWC	PWC	PWC	EY	EY	EY
55	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	EY	EY

The above table reports the Big 4 audit firm with the greatest market share of client sales by year and industry. Market shares are based on 1,970 firm-year observations (Table 2, Panel A). Each industry has at least two audit firms in each industry-year.

Big 4 audit firm abbreviations are as follows:
DT = Deloitte & Touche
EY = Ernst & Young
KPMG = KPMG
PWC = PricewaterhouseCoopers

Industry definitions, based on Global Industry Classification Standards (GICS), are as follows:
GICS 10 - Energy
GICS 15 - Materials
GICS 20 - Industrials
GICS 25 - Consumer Discretionary
GICS 30 - Consumer Staples
GICS 35 - Health Care
GICS 45 - Information Technology
GICS 55 - Utilities
We exclude industry 40 (Financial Services) because it is too dissimilar and we exclude industry 50 (Telecommunications) because it has too few client firms to estimate industry expertise.

Table 1 – Audit Firm Industry Leaders by Year and Industry – Italy Sample (cont.)

Panel B – Area Leaders

NORTH	2005	2006	2007	2008	2009	2010	2011	2012	2013
10	PWC	PWC	PWC	PWC	PWC	PWC	EY	EY	EY
15	EY	EY	EY	EY	EY	EY	KPMG	KPMG	KPMG
20	PWC	PWC	PWC	PWC	PWC	DT	PWC	DT	DT
25	DT	DT	PWC	DT	EY	DT	DT	DT	EY
30	PWC	PWC	PWC	EY	EY	EY	PWC	PWC	PWC
35	EY	EY	EY	EY	DT	DT	DT	PWC	PWC
45	PWC	PWC	PWC	PWC	PWC	PWC	EY	EY	EY
55	PWC	PWC	PWC	PWC	PWC	PWC	PWC	DT	PWC

CENTER-SOUTH	2005	2006	2007	2008	2009	2010	2011	2012	2013
10	PWC	PWC	PWC	PWC	PWC	PWC	EY	EY	EY
15	DT	PWC	PWC	KPMG	KPMG	PWC	PWC	PWC	PWC
20	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC	KPMG
25	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	DT	DT	EY
30	KPMG	KPMG	KPMG	PWC	PWC	PWC	PWC	PWC	PWC
35	EY	EY	EY	EY	EY	EY	EY	EY	DT
45	DT	DT	DT	PWC	PWC	PWC	PWC	PWC	PWC
55	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	EY	EY

The above table reports the Big 4 audit firm with the greatest market share of client sales by area, year and industry. Market shares are based on 1,970 firm-year observations (Table 2, Panel A). Italy is divided into two areas- the North, and the Center-South, based on the EUROSTAT (European Commission, 2014), and the Italian Institute of Statistics (ISTAT 2014) standard geographic definitions. We require that a particular area, industry and year have at least two audit firms, in order to define it as a leader. We aggregate the Center and South areas into one area in order to have sufficient observations to compute industry expertise. The aggregation into one area is consistent with the organization of the Big 4 firms (Mazza, Azzali, & Reichelt, 2017).

Table 2 – Sample Selection

Italy Sample

Sample for computing auditor expertise	**N**
Italian non-financial and non-telecommunication companies from Compustat Global with GICS codes for the period 2005-2013	2,096
Delete observations with missing values necessary to compute auditor expertise	-126
Observations for further analysis using market share based on sales	1,970
Sample for Audit fee analysis	
Number of observations from panel A	1,970
Delete observations with missing values for audit fees and control variables	-920
Final sample for audit fees analysis	1,050
Sample for Audit hours analysis	
Number of observations from panel A	1,970
Delete observations with missing values for audit hours and control variables	-847
Final sample for audit hours analysis	1,123

Audit fee analysis		**Audit hours analysis**	
Year	**Unique firms**	**Year**	**Unique firms**
2005	84	2005	112
2006	104	2006	122
2007	119	2007	137
2008	120	2008	122
2009	122	2009	124
2010	117	2010	118
2011	129	2011	130
2012	125	2012	126
2013	130	2013	132
2005-2013	**1,050**	**2005-2013**	**1,123**

Table 3 – Descriptive Statistics of Variables in Multivariate Analysis

Italy Sample

	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
LAH	7.217	0.815	6.617	7.159	7.758
LAF	11.601	0.827	11.015	11.579	12.086
SIZE	6.272	1.755	5.051	6.022	7.459
CATA	0.500	0.212	0.339	0.488	0.665
QUICK	1.151	0.931	0.699	0.941	1.316
LEV	0.642	0.192	0.538	0.661	0.772
ROA	0.010	0.080	-0.009	0.020	0.046
LOSS	0.297	0.457	0.000	0.000	1.000
σ (CFO)	0.461	0.274	0.279	0.415	0.587
SALES GROWTH	0.621	12.575	-0.047	0.044	0.140
TENURE	3.923	2.313	2.000	4.000	6.000
|ACCR_1|	-3.754	1.332	-4.440	-3.599	-2.847
BIGN	0.886	0.318	1.000	1.000	1.000
UNCLEAN OPINION	0.682	0.466	0.000	1.000	1.000
LABOR COST	42.301	0.769	42.573	42.573	42.573
National Leader	0.352	0.478	0.000	0.000	1.000
Area Leader	0.397	0.490	0.000	0.000	1.000
City Leader	0.379	0.485	0.000	0.000	1.000

See Appendix B for variable definitions.

Table 4 – Correlation Analysis - Italy Sample

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	*LAH*	**1.000**																	
2	*LAF*	**0.916**	**1.000**																
3	*SIZE*	**0.558**	**0.544**	**1.000**															
4	*CATA*	**-0.134**	**-0.142**	**-0.438**	**1.000**														
5	*QUICK*	**-0.275**	**-0.233**	**-0.130**	**0.206**	**1.000**													
6	*LEV*	**0.194**	**0.152**	**0.165**	-0.014	**-0.572**	**1.000**												
7	*ROA*	**0.074**	**0.061**	**0.182**	**0.111**	**0.128**	**-0.400**	**1.000**											
8	*LOSS*	**-0.073**	**-0.076**	**-0.250**	-0.029	**-0.085**	**0.250**	**-0.666**	**1.000**										
9	*σ (CFO)*	**-0.188**	**-0.207**	**-0.374**	**0.215**	-0.044	**0.118**	**-0.183**	**0.173**	**1.000**									
10	*SALES GROWTH*	**-0.096**	**-0.104**	-0.046	-0.027	-0.027	0.057	-0.005	0.028	**0.107**	**1.000**								
11	*TENURE*	**0.079**	**0.095**	**0.091**	**-0.088**	-0.033	**-0.076**	0.011	0.021	-0.054	-0.049	**1.000**							
12	*|ACCR_1|*	**-0.107**	**-0.078**	**-0.260**	**0.168**	-0.017	**0.091**	**-0.146**	**0.093**	**0.250**	**0.090**	-0.051	**1.000**						
13	*BIGN*	**0.207**	**0.254**	**0.309**	**-0.134**	0.051	**-0.080**	**0.146**	**-0.153**	**-0.167**	**-0.109**	**0.115**	**-0.098**	**1.000**					
14	*UNCLEAN OPINION*	0.014	-0.035	-0.046	0.022	-0.003	0.035	**-0.126**	**0.110**	0.057	-0.008	0.029	0.003	-0.016	**1.000**				
15	*LABOR COST*	-0.018	0.003	0.036	0.020	-0.016	0.002	**0.084**	-0.051	0.033	0.015	0.056	-0.013	**-0.107**	-0.013	**1.000**			
16	*National Leader*	**0.256**	**0.267**	**0.265**	-0.030	0.024	0.010	**0.133**	**-0.149**	**-0.129**	-0.031	**0.123**	**-0.104**	**0.264**	**0.070**	-0.041	**1.000**		
17	*Area Leader*	**0.228**	**0.230**	**0.321**	**-0.079**	**0.063**	0.014	**0.120**	**-0.154**	**-0.105**	-0.034	**0.152**	**-0.089**	**0.291**	0.050	**-0.122**	**0.702**	**1.000**	
18	*City Leader*	**0.208**	**0.209**	**0.387**	**-0.082**	**0.067**	0.026	**0.165**	**-0.188**	**-0.099**	-0.033	**0.075**	**-0.111**	**0.228**	-0.002	**0.094**	**0.466**	**0.577**	**1.000**

See Appendix B for variable definitions. Correlation coefficients in bold are significant at 5%.

Table 5 – Multivariate Analysis of Audit Fees and Auditor Industry Leadership – Italy Sample

Dependent variable is the natural logarithm of audit fees (N=1,050)						
Panel A	**Model (1)**		**Model (2)**		**Model (3)**	
	Estimate	**p-value**	**Estimate**	**p-value**	**Estimate**	**p-value**
Intercept	10.470	<0.001	10.266	<0.001	10.521	<0.001
SIZE	0.268	<0.001	0.272	<0.001	0.282	<0.001
CATA	0.628	0.015	0.647	0.014	0.653	0.013
QUICK	-0.216	<0.001	-0.219	<0.001	-0.212	<0.001
LEV	-0.489	0.118	-0.489	0.121	-0.469	0.138
ROA	-0.669	0.165	-0.667	0.178	-0.643	0.199
LOSS	0.108	0.178	0.102	0.205	0.097	0.228
σ (CFO)	-0.054	0.771	-0.066	0.718	-0.053	0.774
SALES GROWTH	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001
TENURE	0.005	0.678	0.005	0.658	0.008	0.474
|ACCR_1|	0.037	0.051	0.035	0.070	0.035	0.069
BIGN	0.197	0.050	0.224	0.027	0.255	0.012
UNCLEAN OPINION	0.000	0.993	0.010	0.846	0.018	0.736
LABOR COST	-0.013	0.776	-0.009	0.858	-0.016	0.729
National Leader	**0.205**	**0.002**				
Area Leader			**0.114**	**0.079**		
City Leader					**0.006**	**0.929**
Industry and Year fixed effects	included		included		included	
Adj. R^2	0.406		0.397		0.407	

Panel B : test of difference in coefficients	**Difference in Coefficients**	**F-Test (p-value)**
National Leader = Area Leader	0.091	5.09 (0.024)

Coefficient p-values in Panel A are two-tailed and robust standard errors are clustered by firm, following Peterson (2009). F-test p-values in Panel B are one-tailed. Refer to Appendix B for variable definitions.

Table 6 – Multivariate Analysis of Audit Hours and Auditor Industry Leadership – Italy Sample

Dependent variable is the natural logarithm of audit hours (N=1,123)						
Panel A	**Model (1)**		**Model (2)**		**Model (3)**	
	Estimate	**p-value**	**Estimate**	**p-value**	**Estimate**	**p-value**
Intercept	7.249	<0.001	7.028	<0.001	7.252	<0.001
SIZE	0.280	<0.001	0.284	<0.001	0.290	<0.001
CATA	0.753	0.002	0.766	0.003	0.771	0.002
QUICK	-0.235	<0.001	-0.236	<0.001	-0.231	<0.001
LEV	-0.281	0.333	-0.274	0.349	-0.254	0.385
ROA	-0.037	0.925	-0.017	0.966	0.000	0.999
LOSS	0.161	0.012	0.157	0.015	0.152	0.019
σ (CFO)	-0.012	0.940	-0.023	0.884	-0.017	0.915
SALES GROWTH	-0.004	<0.001	-0.004	<0.001	-0.004	<0.001
TENURE	0.000	0.969	0.001	0.927	0.004	0.743
|ACCR_1|	0.017	0.336	0.015	0.400	0.015	0.398
BIGN	0.059	0.521	0.082	0.379	0.109	0.241
UNCLEAN OPINION	0.065	0.174	0.076	0.121	0.083	0.090
LABOR COST	-0.027	0.364	-0.023	0.460	-0.030	0.322
National Leader	**0.183**	**0.005**				
Area Leader			**0.101**	**0.094**		
City Leader					**0.014**	**0.832**
Industry and Year fixed effects	included		included		included	
Adj. R^2	0.432		0.425		0.436	

Panel B : test of difference in coefficients	**Difference in Coefficients**	**F-Test (p-value)**
National Leader = Area Leader	0.082	3.97 (0.046)

Coefficient p-values in Panel A are two-tailed and robust standard errors are clustered by firm, following Peterson (2009). F-test p-values in Panel B are one-tailed. Refer to Appendix B for variable definitions.

Table 7 – Audit Firm Leaders by Year and Industry – Germany Sample (cont.)

Panel A – National Leaders

	2005	2006	2007	2008	2009	2010	2011	2012	2013
10	PWC	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	PWC	PWC
15	PWC	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG
20	KPMG	KPMG	PWC	KPMG	EY	PWC	PWC	PWC	PWC
25	KPMG	KPMG	KPMG	PWC	PWC	PWC	PWC	PWC	PWC
30	PKF	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG
35	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC
45	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG
55	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC

The above table reports the Big 4 audit firm with the greatest market share of client sales by year and industry. Market shares are based on 4,217 firm-year observations (Table 2, Panel B). Each industry has at least two audit firms in each industry-year.

Big 4 audit firm abbreviations are as follows:
DT = Deloitte & Touche
EY = Ernst & Young
KPMG = KPMG
PWC = PricewaterhouseCoopers

Non-Big 4 audit firm abbreviations are as follows:
PKF – PKF

Industry definitions, based on Global Industry Classification Standards (GICS), are as follows:
GICS 10 - Energy
GICS 15 - Materials
GICS 20 - Industrials
GICS 25 - Consumer Discretionary
GICS 30 - Consumer Staples
GICS 35 - Health Care
GICS 45 - Information Technology
GICS 55 - Utilities
We exclude industry 40 (Financial Services) because it is too dissimilar and we exclude industry 50 (Telecommunications) because it has too few client firms to estimate industry expertise.

Table 7 – Audit Firm Leaders by Year and Industry – Germany Sample (cont.)

Panel B - Area Leaders

EAST	2005	2006	2007	2008	2009	2010	2011	2012	2013
10	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC
15	EY	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG
20	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC
25	KPMG	KPMG	PWC	PWC	PWC	PWC	PWC	PWC	PWC
30	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC
35	PWC	PWC	PWC	EY	EY	EY	EY	EY	EY
45	EY	KPMG	KPMG	KPMG	KPMG	KMPG	KPMG	KPMG	KPMG
55	EY	EY	EY	EY	EY	KPMG	KPMG	KPMG	KPMG

WEST	2005	2006	2007	2008	2009	2010	2011	2012	2013
10	PWC	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG
15	PWC	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	PWC
20	KPMG	KPMG	KPMG	KPMG	EY	EY	EY	EY	EY
25	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG
30	PKF	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG
35	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC	KPMG
45	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG	KPMG
55	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC	PWC

The above table reports the Big 4 audit firm with the greatest market share of client sales by area, year and industry. Market shares are based on 4,217 firm-year observations (Table 2, Panel B). Germany is divided into two areas- East and West, based on the EUROSTAT (European Commission, 2014) standard geographic definitions. East includes the following subdivisions: Berlin, Brandenburg, Mecklenburg-Vorpommern, North Rhine-Westphalia, Saxony, Saxony-Anhalt, and Thuringia. West includes Baden-Württemberg, Bavaria, Bremen, Hamburg, Hessen, Lower Saxony, Rhineland-Palatinate, Saarland, and Schleswig-Holstein. We require that a particular area, industry and year have at least two audit firms, in order to define it as a leader. Areas without a leader in a particular industry and year have only one audit firm.

Table 8 – Sample Selection (cont.)

Germany Sample

Sample for computing auditor expertise	**N**
German non-financial and non-telecommunication companies from Compustat Global with GICS codes for the period 2005-2013	5,245
Delete observations with missing values necessary to compute auditor expertise (auditor data)	-1,028
Observations for further analysis using market share based on sales	4,217
Delete observations with missing values for audit fees and control variables	-1,307
Final sample for audit fees analysis	2,910

Audit fee analysis	
Year	**Unique firms**
2005	245
2006	314
2007	338
2008	328
2009	337
2010	338
2011	350
2012	337
2013	323
2005-2013	**2,910**

Table 9 – Descriptive Statistics of Variables in Multivariate Analysis (cont.)

Germany Sample

	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
LAF	5.407	1.210	4.553	5.242	6.054
SIZE	5.485	2.167	3.985	5.173	6.797
CATA	0.533	0.202	0.391	0.539	0.674
QUICK	1.567	1.722	0.784	1.123	1.762
LEV	0.126	0.145	0.004	0.082	0.193
ROA	0.040	0.140	0.013	0.056	0.099
LOSS	0.245	0.430	0.000	0.000	0.000
σ (CFO)	0.293	0.690	0.053	0.095	0.218
SALES GROWTH	0.119	0.918	-0.036	0.055	0.154
TENURE	4.778	3.184	2.000	4.000	7.000
|ACCR_1|	-3.065	1.188	-3.679	-2.920	-2.318
BIGN	0.711	0.454	0.000	1.000	1.000
UNCLEAN OPINION	0.095	0.293	0.000	0.000	0.000
LABOR COST	51.241	4.767	49.421	51.388	54.219
National Leader	0.186	0.389	0.000	0.000	0.000
Area Leader	0.213	0.410	0.000	0.000	0.000
City Leader	0.287	0.453	0.000	0.000	1.000

See Appendix B for variable definitions.

Table 10 – Correlation Analysis (cont.)

Germany Sample

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	*LAF*	**1.00**																
2	*SIZE*	**0.89**	**1.00**															
3	*CATA*	**-0.26**	**-0.27**	**1.00**														
4	*QUICK*	**-0.23**	**-0.20**	**0.37**	**1.00**													
5	*LEV*	**0.21**	**0.18**	**-0.44**	**-0.24**	**1.00**												
6	*ROA*	**0.16**	**0.26**	0.00	0.02	**-0.09**	**1.00**											
7	*LOSS*	**-0.13**	**-0.22**	-0.01	**-0.04**	**0.10**	**-0.57**	**1.00**										
8	*σ (CFO)*	0.004	**0.04**	-0.04	-0.01	0.03	**-0.05**	0.01	**1.00**									
9	*SALES GROWTH*	**-0.04**	-0.02	0.02	-0.01	0.02	**0.05**	**-0.05**	**0.01**	**1.00**								
10	*TENURE*	**0.21**	**0.18**	**-0.04**	**-0.05**	0.03	**0.12**	**-0.11**	**-0.04**	**-0.04**	**1.00**							
11	*|ACCR_1|*	**-0.12**	**-0.16**	0.01	-0.02	**0.10**	**-0.17**	**0.16**	**0.05**	**-0.04**	**-0.05**	**1.00**						
12	*BIGN*	**0.39**	**0.39**	**-0.09**	**-0.04**	0.02	**0.11**	**-0.05**	-0.01	0.003	**0.05**	-0.03	**1.00**					
13	*UNCLEAN OPINION*	**-0.08**	**-0.14**	0.02	**-0.06**	**0.10**	**-0.27**	**0.23**	-0.01	0.02	**-0.08**	**0.11**	**-0.09**	**1.00**				
14	*LABOR COST*	**0.06**	**0.09**	**-0.08**	-0.01	0.03	**0.10**	-0.03	**0.05**	-0.02	**0.09**	**-0.04**	**-0.05**	-0.01	**1.00**			
15	*National Leader*	**0.32**	**0.30**	**-0.06**	-0.03	0.00	**0.10**	**-0.06**	-0.01	-0.03	**0.09**	**-0.04**	**0.30**	**-0.08**	**-0.04**	**1.00**		
16	*Area Leader*	**0.31**	**0.31**	**-0.10**	-0.02	0.02	**0.07**	**-0.05**	**0.06**	-0.03	**0.11**	**-0.04**	**0.33**	**-0.08**	**-0.04**	**0.56**	**1.00**	
17	*City Leader*	**0.38**	**0.39**	**-0.09**	-0.03	**0.05**	**0.08**	**-0.09**	0.01	-0.03	**0.10**	-0.04	**0.30**	-0.02	-0.03	**0.29**	**0.44**	**1.00**

See Appendix B for variable definitions. Correlation coefficients in bold are significant at 5%.

Table 11 – Multivariate Analysis of Audit Fees and Auditor Industry Leadership – Germany Sample

Dependent variable is the natural logarithm of audit fees (N=2,910)						
Panel A	**Model (1)**		**Model (2)**		**Model (3)**	
	Estimate	**p-value**	**Estimate**	**p-value**	**Estimate**	**p-value**
Intercept	2.162	0.000	2.134	0.000	2.213	0.000
SIZE	0.492	0.000	0.493	0.000	0.493	0.000
CATA	0.023	0.852	0.027	0.825	0.022	0.857
QUICK	-0.036	0.001	-0.037	0.000	-0.036	0.001
LEV	0.262	0.079	0.253	0.088	0.244	0.104
ROA	-0.485	0.000	-0.473	0.001	-0.467	0.001
LOSS	0.082	0.019	0.082	0.020	0.087	0.014
σ (CFO)	-0.047	0.183	-0.051	0.146	-0.049	0.171
SALES GROWTH	-0.028	0.000	-0.028	0.000	-0.029	0.000
TENURE	0.018	0.001	0.018	0.001	0.019	0.001
|ACCR_1|	0.005	0.606	0.006	0.581	0.005	0.608
BIGN	0.113	0.021	0.113	0.021	0.130	0.007
UNCLEAN OPINION	0.110	0.016	0.109	0.019	0.101	0.028
LABOR COST	-0.003	0.482	-0.003	0.469	-0.003	0.433
National Leader	**0.145**	**0.002**				
Area Leader			**0.122**	**0.027**		
City Leader					**0.057**	**0.227**
Industry and Year fixed effects	included		included		included	
Adj. R^2	0.819		0.819		0.818	

Panel B : test of difference in coefficients	**Difference in Coefficients**	**F-Test (p-value)**
National Leader = Area Leader	0.023	0.79 0.373

Coefficient p-values in Panel A are two-tailed and robust standard errors are clustered by firm, following Peterson (2009). F-test p-values in Panel B are one-tailed. Refer to Appendix B for variable definitions.

Appendix A - Comparison of Auditor Industry Leadership Audit Fee Premiums from Prior Studies

Industry Leadership Coefficient (Premium/Discount)

Study, Country, and Time Period	National Level	Office Level
Ferguson et al. (2003) – Australia (1998)	0.069 (7.1%)	0.143 (15.4%)
Francis et al. (2005)– US (2000-01)	0.075 (7.8%)	0.121 (12.9%)
Basioudis and Francis (2007)– UK (2002-03)	0.018‡ (1.8%)	0.145 (15.6%)
Cahan et al. (2011)- US (2003-07)	0.073 (7.6%)	
Numan and Willekens (2012) – US (2005-06)	-0.040‡ (-3.9%)	0.133 (14.2%)
Fung, Gul, and Krishnan (2012) – US (2000-07)		0.138 (14.8%)
Bae et al. (2016)– S. Korea (2001-10)	0.077 (8.0%)	

‡ - coefficient is not statistically significant at 5% (two-tailed).

Appendix B- Variable Definitions

Dependent Variables used in Audit Fees and Hours analysis (*source: annual shareholder meeting minutes*)	
LAF	= natural logarithm of total audit fees for the audit of consolidated financial statements and separate audits of the financial statements of the parent and the subsidiaries (winsorized at the 1st and 99th percentiles)
LAH	= natural logarithm of audit hours for the audit of consolidated financial statements (winsorized at the 1st and 99th percentiles)
Expertise Variables (*source: Compustat Global (total sales and GICS), Eurostat (area), and annual shareholder meeting minutes (audit firm and location*))	
National Industry specialist	The audit firm with the largest market share (client total sales) by two-digit GICS and year.
Area Industry Specialist	The audit firm with the largest market share (client total sales) by two-digit GICS, area, and year. There are two areas: North, and Center-South.
City Industry Specialist	The audit firm with the largest market share (client total sales) by two-digit GICS, city, and year. There are twenty cities, based on the twenty regions, in Italy: North (Valle d'Aosta, Veneto, Trentino Alto Adige, Friuli Venezia Giulia, Emilia Romagna, Lombardia, Liguria, Piemonte), Center (Lazio, Toscana, Umbria, Marche) and South (Abruzzo, Molise, Campania, Basilicata, Puglia, Calabria, Sicilia, Sardegna).
Control variables (winsorized at the 1st and 99th percentiles) (*source: Compustat Global, except as indicated*)	
SIZE	= the natural logarithm of total assets at the end of the fiscal year;
σ (CFO)	= the standard deviation of operating cash flow scaled by total assets at the beginning of the fiscal year;
LEV	= total long-term debt scaled by total assets at the end of the fiscal year;
LOSS	= 1 if net income < 0, and 0 otherwise;
SALES GROWTH	= $(\text{revenue}_t - \text{revenue}_{t-1})/\text{revenue}_{t-1}$ for the fiscal year ended;
TENURE	= tenure of the audit firm (minimum of one year and maximum of nine years). (*source: annual shareholder meeting minutes*);

QUICK	= ratio of current assets (less inventories) to current liabilities;
ROA	= ratio of earnings before interest and tax to total assets;
UNCLEAN OPINION	= 1 if the audit opinion in not unqualified (additional language, qualified, adverse, or no opinion) and 0 if unqualified;
|ACCR 1|	= absolute value of total accruals in year $t - 1$ scaled by total assets at the end of $t - 1$ (in logarithm in the audit fees and hours models);
BIGN	= 1 if audited by a Big N auditor, and 0 otherwise. (*source: annual shareholder meeting minutes*);
CATA	= ratio of current assets to total assets;

Appendix C – Examples of Audit Fee Disclosures Extracted from the Minutes of the Annual Shareholder Meeting

The following examples are audit fee and hour disclosures extracted from English translations of the minutes of annual shareholder meetings provided by the firm's website. Original Italian versions are available from the Borsa Italiana SpA website: http://www.borsaitaliana.it/homepage/homepage.en.htm.

1. PIRELLI & C. S.p.A.

Available from: http://www.pirelli.com/mediaObject/corporate/documents/common/assemblea/may_2013/13052013-Minutes_of_the_Ordinary_and_Extraordinary_Shareholders-_Meeting/original/13052013-Minutes_of_the_Ordinary_and_Extraordinary_Shareholders%27_Meeting.pdf

ORDINARY SHAREHOLDERS' MEETING ON MAY 13, 2013

(English courtesy translation – the Italian version shall prevail)

The Ordinary and Extraordinary Shareholders' Meeting of PIRELLI & C. S.p.A. (hereinafter, the "Company" or "Pirelli") began at 10:30 a.m. on May 13, 2013 in Milan, Viale Sarca n. 214. Mr. Marco Tronchetti Provera chaired the Shareholders' Meeting pursuant to the Bylaws and, with the unanimous approval of those present, he asked Prof. Piergaetano Marchetti to act as Secretary of the meeting. Prof. Marchetti accepted this request and expressed his thanks. First of all, the Chairman announced that the Shareholders' Meeting has been called to discuss and resolve on the following:

AGENDA

1. Financial Statements as at 31st December 2012. Inherent and consequent resolutions
2. ….

*** (page 18)

Before opening discussion on the first item on the agenda, the Chairman announced that the fee charged by the accounting firm, Reconta Ernst & Young S.p.A.

• totalled euro 64,350, for a total of 1,073 hours, to audit the Annual Financial Report 2012 of Pirelli & C. S.p.A.;

• totalled euro 123,350, for a total of 1,493 hours, to audit the Consolidated Financial Statements 2012 of the Pirelli & C. Group;

• totalled euro 64,060, for a total of 642 hours, for the limited audit of the Half Yearly Financial Report at June 30, 2012 of the Pirelli & C. Group;

- stated that, as reported last year, these fees are in addition to the fee of euro 16,000 for the activities connected with the fairness opinion on certain of the information contained in the

Report on Corporate Governance and the Structure of Share Ownership 2012, pursuant to Article 123-bis of Legislative Decree 58/1998;

- he also observed that the time and fees charged for auditing the annual report also included the billable time dedicated to auditing proper record-keeping by the Company and proper accounting of operations in the Company ledgers.

These fees do not include out-of-pocket expenses and the Consob supervisory fee, which are billed at cost.

2. DAVIDE CAMPARI-MILANO S.p.A

Available from:
http://www.camparigroup.com/sites/default/files/docs/minutes_of_the_ordinary_shareholders_meeting_of_davide_campari-milano_s.p.a._of_30_april_2014_final.pdf

MINUTES OF THE ORDINARY SHAREHOLDERS' MEETING OF DAVIDE CAMPARI-MILANO S.p.A. OF 30 APRIL 2014

The ordinary shareholders' meeting of Davide Campari-Milano S.p.A., with registered office at 20, Via Franco Sacchetti, 20099 Sesto San Giovanni (Milan), share capital of € 58,080,000.00 (fully paid up), tax and VAT code and registration number in the Milan Companies' Register 06672120158, took place at single call at 9:30 on 30 April 2014, at the premises of the Campari Academy at via Campari 23, to discuss and pass resolutions on the following

Agenda

1. Approval of the annual financial statements for the year ending 31 December 2013 and related resolutions;
2. …

…

The Chairman also explained that:

- with regard to the auditing of the financial statements, pursuant to Consob Communication DAC/RM/96003558 of 18 April 1996, the meeting was notified that: (i) PricewaterhouseCoopers S.p.A. spent 2,985 working hours on the audit of the draft separate financial statements and the consolidated financial statements to 31 December 2013, broken down as follows: statutory audit of the separate annual financial statements and review of the accounting procedures, pursuant to articles 14 and 16 of Legislative Decree 39 of 27 January 2010, 2,135 hours; and statutory audit of the consolidated financial statements, 850 hours; (ii) the projected invoiced amount was € 202,000, of which € 127,000 for the audit of the separate financial statements and € 75,000 for the audit of the consolidated financial statements, in accordance with the resolution of the shareholders' meeting that conferred the auditing assignment.